



Xplor



O SAY CAN
YOU SEE?

NATURE SHOWS OFF THE
RED, WHITE, AND BLUE

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Celebrate Independence Day with some patriotic plants and animals.

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Pull out this poster and tape it to your wall to make your room look wild.

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Summer is the perfect time to splash around in a cool, clear Ozark stream, like these Xplorers who are launching a flotilla of canoes into the Meramec River near Steelville.

📷 by David Stonner



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We recycle.

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Xplor with friends.**

ON THE COVER

Red Swamp Crayfish

by Chris Lukhaup

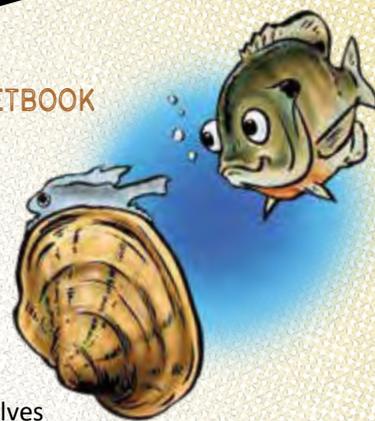
STRANGE BUT TRUE

Your guide to all the
**UNUSUAL, UNIQUE,
AND UNBELIEVABLE**
stuff that goes on in nature

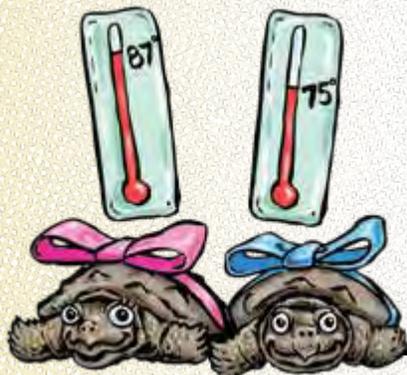
CHIMNEY SWIFTS use saliva to glue twigs together for a nest and keep it stuck tight to the inside of a chimney, hollow tree, or cave. Now that's some sticky spit!



Female **PLAIN POCKETBOOK MUSSELS** wave body parts that look like small, swimming fish. When a big fish strikes at the "lure," the mama mussel squirts out a cloud of tiny babies. The baby mussels attach themselves to the fish for a free ride.



Temperature determines whether **EASTERN SNAPPING TURTLES** will be born boys or girls. Turtle eggs kept at lower temperatures hatch as mostly males. Eggs kept at higher temperatures hatch as mostly females.



Mmmm, crunchy! **PURPLE MARTINS** gobble gravel and eggshells. The gritty bits stay in the birds' guts to help grind up the hard skeletons of insects that martins eat.



RUBY-THROATED HUMMINGBIRDS normally beat their wings about 50 times a second. That's fast, but it's a bummer compared to a lovestruck hummer. When trying to impress a mate, males flap their wings 200 times a second.



EASTERN FOX SQUIRRELS have sweat glands between their toes. When a squirrel gets excited or hot, its paw prints become wet from sweat.



MONARCH CATERPILLARS munch milkweed, a poisonous plant. The caterpillars store the poisons in their tissues and aren't harmed. By the time they turn into butterflies, they're so toxic, birds that eat them throw up.



WHAT IS IT?

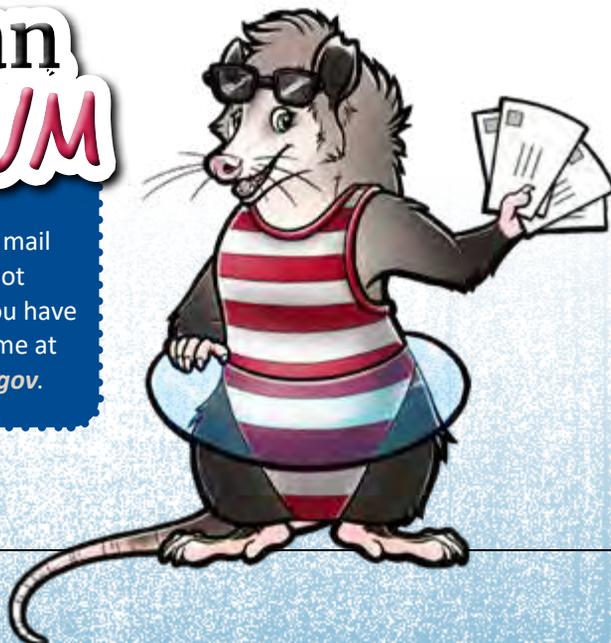
DON'T KNOW? Jump to page 21 to find out.

- 1 Despite my ferocious name,
- 2 I really don't breathe out flames.
- 3 But I'm feared in the skies just the same.
- 4 'Cause my vision puts most things to shame.



Ask an OPOSSUM

Hi! I'm Phi, *Xplor's* mail possum. I know a lot about nature. If you have a question, email me at AskPhi@mdc.mo.gov.



Q: Why do fireflies glow?

— From Reese, age 12

A: A firefly's twinkling tush is like a chemistry lab. Various ingredients mix together, causing a reaction that makes light. Unlike a light bulb, the glow gives off little heat. Which is good because the firefly doesn't want its bottom to burn up! Fireflies use their blinky backsides to chat with each other in the dark. A male blinks: "Here I am. Do you like me?" A female blinks back if she spots a male she fancies.

HOW TO

SAFELY RELEASE A FISH

To keep the fish you free safe from harm, master the art of letting go.

Sometimes, fishing rules require you to release a fish because it's the wrong size or the wrong species. And sometimes, you'd rather fish for fun than for food. Here's how to release a fish the right way, so it has the best chance of living.

LAND 'EM QUICKLY



- Set the hook as soon as you feel a bite. This makes it less likely the fish will swallow the hook.
- Reel in your catch as quickly as you can — but don't jerk the lips off the little fella. Fighting a fish longer than necessary wears it out and weakens its ability to survive.
- Keep a fish in the water as much as possible when removing the hook or taking a photo. A fish's odds of survival decrease the longer it's kept out of the water.

TAKE THE RIGHT TACKLE



- Choose artificial lures. Fish are more likely to swallow live bait and become deeply hooked, which can damage their organs.
- Carry a pair of needle-nose pliers or hemostats to remove hooks from small-mouthed fish like bluegill.
- Use a pair of pliers to pinch the barbs flat on your hooks. This makes removing them from a fish's mouth (or your dad's earlobe) much easier.

HANDLE CAREFULLY

- Wet your hands before touching a fish. This protects its slimy skin, which guards the fish from germs.
- Be gentle. Squeezing a fish too hard can damage its organs. And keep your fingers away from its gills and eyes. It needs those to breathe and to see!
- If your catch is hooked deeply — in its gills or stomach — it's best to simply leave the hook alone and cut the line. The fish will have a better chance of living than if you try to perform stream-side surgery to remove the hook.



REVIVE TIRED FISH

- If your fish doesn't have enough energy to swim away, hold its tail with one hand and cradle its belly with the other.
- Slowly move the fish back and forth below the surface so water flows over its gills.
- When the fish's energy returns, release your grip so it can swim away.



Nature's Red, White,

1
When I get cut, I "bleed" blue "milk."

2
One of Santa's reindeer shares my name.

3
I shine blue in the sun and turn black in the shade.



CLUE #1 (SECOND): © TONY BOSSE | DREAMSTIME.COM; CLUE #2 (FIRST, THIRD): © JULIE FEINSTEIN | DREAMSTIME.COM



1

Indigo Milky

When this mushroom is damaged, a blue, milky fluid leaks out. Indigo milkies are edible — and delicious. Mushroom hunters add them to scrambled eggs to make green eggs and ham. Find them in oak woods across Missouri from July to October.



2

Blue Dasher

You know Dasher and Dancer, Comet and Cupid. But do you recall the most famous dragonfly of all? Blue dashers are one of Missouri's most common dragonflies, found on nearly any marsh, river, or lake. Only males are blue. Females have black and yellow stripes.



3

Indigo Bunting

This bird's brilliant feathers are an illusion. They don't contain any blue. Instead, structures in the feathers reflect blue light. Without sunshine, they turn dark. See for yourself by watching an indigo bunting dart in and out of thickets anywhere in Missouri.



4

Northern Cardinal

St. Louis named its baseball team after this brilliant bird. The bird itself is named for cardinals of the Roman Catholic Church who wear crimson robes. Redbirds can be seen flitting around backyards and thickets throughout the state.



5

Flowering Dogwood

The white "petals" on this shrubby tree are what botanists call bracts, a type of leaf. The real flowers are found in small green clusters in the center of the bracts. Shade-loving dogwoods bloom in forests across Missouri in April and May.



6

Emetic Russula

This poisonous mushroom crumbles in your hands like a brittle piece of chalk. As the word "emetic" suggests, it will cause you to throw up — often violently — if you eat it. Find this fungi from July to October in damp, wooded areas across Missouri.



7

American White Pelican

Stretching nearly a foot and a half long, a pelican's beak can hold nearly three gallons of water — about as much as two toilet flushes. The big birds migrate through Missouri in spring and fall, stopping to rest and fish on marshes and lakes.



8

Northern Scarletsnake

This secretive serpent spends most of its life underground, coming to the surface only on warm nights or after heavy rains. Your best chance to find it is in the Bootheel or on wooded, rocky hillsides in central and southwestern Missouri.



9

Destroying Angel

This common mushroom is beautiful but *extremely* poisonous. If it's eaten, a victim's liver and kidneys may quit working, leading to death. Destroying angels are found in woods and around trees in backyards throughout Missouri.



10

Columbine

Columbine begins blooming in April in Missouri, just in time for the arrival of ruby-throated hummingbirds, the flower's prime pollinator. Look for the shade-loving plant throughout Missouri on rocky bluffs, wooded hillsides, and along streams.



11

Snowy Owl

Snowy owls aren't night owls — they're early birds. On the Arctic tundra where they normally live, the sun doesn't set during summer, so they have no choice but to hunt during the day. When food gets scarce in winter, they head south to Missouri.



12

Red Swamp Crayfish

This crayfish is farmed for food in the state of Louisiana, where it's boiled with spices, potatoes, and corn then dumped on newspapers for feasts with friends. In Missouri, the colorful crustacean is found in Bootheel swamps, sloughs, and ditches.



13

Spring Azure

The spring azure is a true forecaster of spring. It is our earliest butterfly to emerge from its chrysalis, often in mid-March. (Other early butterflies overwinter as adults.) Look for it fluttering around brushy fields, gardens, and woods throughout Missouri.



14

Cardinal Flower

Cardinal flowers don't begin blooming until July and don't finish until October — which is fine for hungry hummingbirds. They guzzle the flower's nectar to fuel up for fall migration. Look for the brilliant blossoms along streams throughout the state.



15

Snow Goose

Snow geese come in two colors: white and blue. Once considered a separate species, the "blue goose" isn't blue at all. It's mostly grayish-brown. Snow geese can create quite a blizzard when they flock with friends at Missouri's wetlands in winter.



16

Summer Tanager

Male summer tanagers are the only all-red birds in America. Females are yellow. Both sexes make a living catching bees and wasps on the wing, bashing them against branches, and gobbling them down. Look for them high in the treetops of forests.

EASTERN BLUEBIRD

POWERFUL PEEPERS

A bluebird can spot a tiny green caterpillar crawling through the grass from 60 feet away.

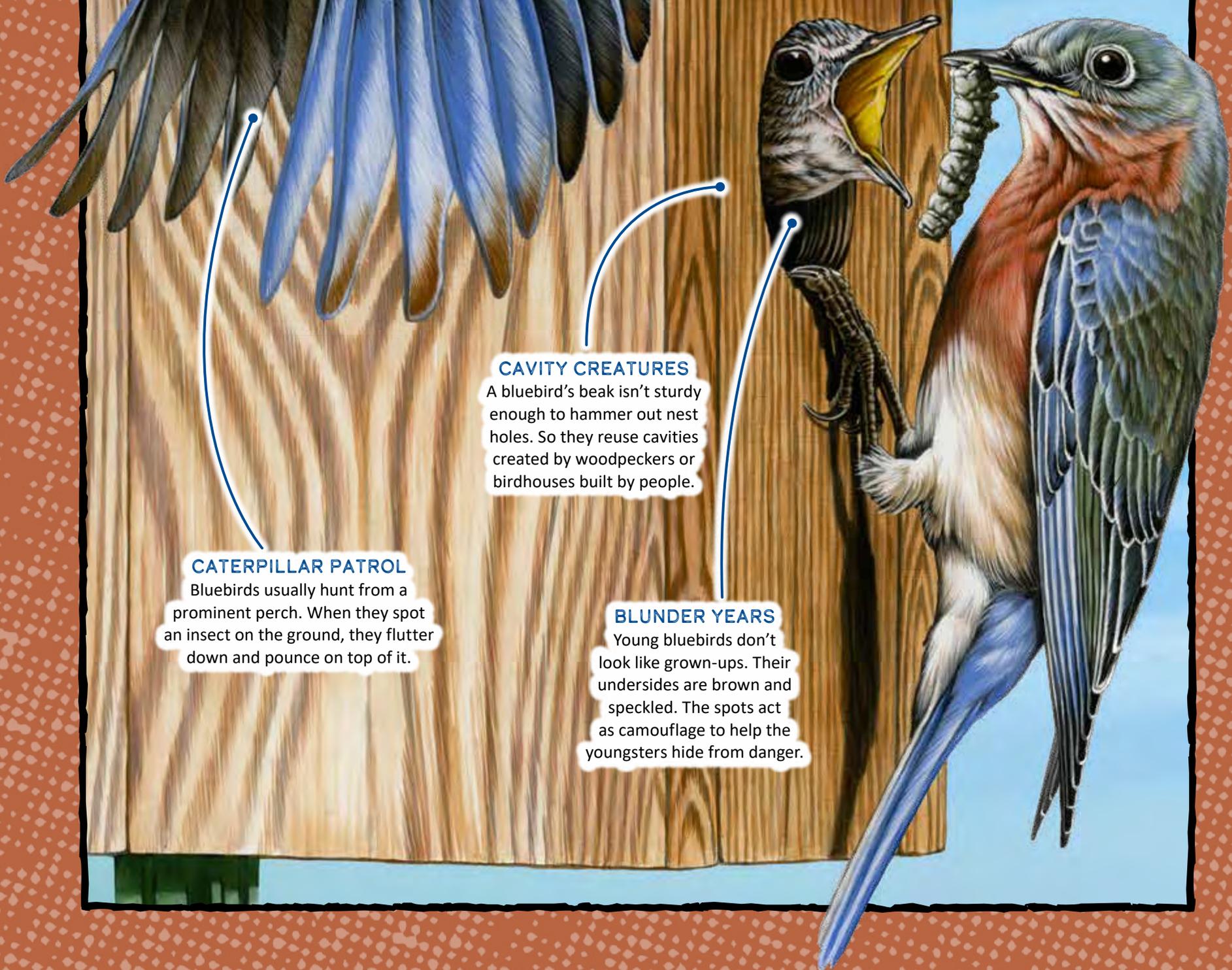
GROUCHY NEIGHBORS

Holes for nesting are often in short supply. Bluebirds chase chickadees, tree swallows, and other cavity-nesters away.

MENU SWITCHEROO

In the fall, bluebirds begin to eat fewer insects and more berries, like dogwood, wild grape, and even poison ivy.





CATERPILLAR PATROL

Bluebirds usually hunt from a prominent perch. When they spot an insect on the ground, they flutter down and pounce on top of it.

CAVITY CREATURES

A bluebird's beak isn't sturdy enough to hammer out nest holes. So they reuse cavities created by woodpeckers or birdhouses built by people.

BLUNDER YEARS

Young bluebirds don't look like grown-ups. Their undersides are brown and speckled. The spots act as camouflage to help the youngsters hide from danger.



DONNA BRUNET

While their flashy, day-flying cousins, the butterflies, seem to get all the glory, Missouri's moths are just as amazing.

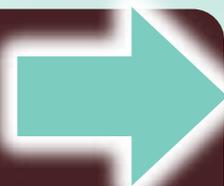
Giants of the Night

There are more moths in the Show-Me State than butterflies. Biologists believe at least 3,000 kinds flutter around our forests, prairies, and backyards from spring through fall — and not just at night. A variety of hawk and sphinx moths can be found visiting flowers during the day.

Moths play a huge role in nature. Some pollinate flowers, which helps plants make seeds. The oversized appetites of moth caterpillars keeps other plants in check. Birds rely on caterpillars as an easy meal, and bats snarf down moths by the mouthful.

Although many moths are small and drab to blend in with their surroundings, others are large and colorful. For this mini field guide, we chose 10 of Missouri's biggest and boldest furry flutterers.

First, Make This Field Guide



- 1 Cut out the next two pages along the dotted lines.
- 2 Fold each cutout down the middle.
- 3 Stack the cutouts so the pages are in numerical order.
- 4 Staple the cutouts together at the fold between pages 8 and 9.
- 5 Take your mini field guide out at night to look for moths.



mdc.mo.gov

You Discover MOTHS



A Mini Field Guide to 10 of Missouri's Most Amazing Moths

White-Lined Sphinx



HABITAT: Flower gardens, backyards, prairies



FLIGHT SEASON: April–November



ACTIVE TIME: Nearly any time, day and night



CATERPILLAR FOODS: Large variety of plants

Like most hawk and sphinx moths, white-lined sphinxes have tongues that are longer than their bodies. They use them to sip nectar while hovering near flowers.



Pupa

After several weeks, the now chubby caterpillar searches for somewhere safe to turn into a pupa (*pyoo-puh*). Some, like imperial caterpillars, burrow underground. Most spin a silky cocoon around themselves for protection. Polyphemus caterpillars wrap leaves around their cocoons for camouflage. Some caterpillars spend winter in their cocoons. Others change into moths in a few days or weeks.

Adult

While a caterpillar is focused on eating, an adult moth is focused on finding a mate. A female releases pheromones (*fair-oh-moans*), “perfumes” that male moths find irresistible. Males use their feathery antennae to follow the pheromones to the female. After mating, she looks for plants her babies will like to eat (called host plants). She lays dozens — or even hundreds — of eggs on the host plants, and the cycle starts again.

Masters of Metamorphosis

Baby moths don't look anything like their parents! That's because moths (and their close relatives, butterflies) undergo metamorphosis (*met-uh-more-foe-sis*).

Life Cycle of a Polyphemus Moth



Eggs

A moth starts life as a tiny egg. After a few days, an itty-bitty caterpillar hatches out.

Caterpillar

A caterpillar has but one thought in its squishy little brain: food. Some caterpillars eat only one kind of plant. Others eat many kinds. As the caterpillar eats and eats, it doesn't stay little for long.

2

Chonkerpillars

Some caterpillars grow freakishly large.

Hickory horned devils (aka regal moth caterpillars) are Missouri's largest larvae. They can reach over 5½ inches long — about as big as a hot dog. They're covered in scary-looking spikes, but they're completely harmless.

Cecropia moth caterpillars

aren't just one of Missouri's largest caterpillars, they're also among the most colorful. They can grow longer than most grown-ups' fingers and are covered in a rainbow of harmless spikes.

Tomato hornworms

(aka five-spotted hawk moth caterpillars) may look big and colorful, but they blend in perfectly with the tomato leaves they love to eat.

If you see this caterpillar, **DON'T TOUCH IT!** The **lo moth caterpillar's** prickly spines can deliver a painful sting.

4

Snowberry Clearwing

WING SPAN: 1–2 inches



HABITAT: Flower gardens, backyards, weedy fields



FLIGHT SEASON: March–October



ACTIVE TIME: Sunrise–sunset



CATERPILLAR FOODS: Coral berry, gentian, blue star

The buzz of its clear wings and the black and yellow bands on its abdomen make this moth easy to mistake for a bumblebee.

15

Pandorus Sphinx

WING SPAN: 3–4 inches



HABITAT: Flower gardens, edges of fields and streams



FLIGHT SEASON: May–October



ACTIVE TIME: Sunset



CATERPILLAR FOODS: Wild grapes and Virginia creeper

The dark brown larvae are hard to see during the day but easy to find at night. When you shine an ultraviolet flashlight (often called a black light) at them, they glow in the dark.

13

Five-Spotted Hawk Moth



HABITAT: Vegetable gardens



FLIGHT SEASON: May–October



ACTIVE TIME: Sunset



CATERPILLAR FOODS: Tomato, pepper, and potato plants

Beware! This moth's caterpillars, called tomato hornworms, can quickly eat all the leaves from the vegetables growing in your summer garden.

Tips for Finding Moths



Stay Up Late

Some moths, like clearwings, fly during the day. But many come out at night. Getting a glimpse of one might involve asking a grown-up if you can stay up late.

Explore Porch Lights

Biologists believe moths use the moon to find their way in the dark. Bright lights, like those from porch lights, throw off this “moon compass,” making the moth zero in on the light instead. Check outdoor lights at different times of the night to see what colorful characters have been lured in.

Hang Up a Light Sheet

It's easy to build a moth magnet. Just hang a white sheet between two trees and put a bright light, like a lantern, behind it. In no time, a blizzard of moths will collect on the sheet, giving you great looks at a variety of night fliers.

Make Moth Mash

Take an overripe banana — the browner, the better — put it in a bowl, and squish it into goo. Stir in a cup of apple juice and half a cup of honey. Let the mixture “ripen” for a few days then use a paintbrush to slop it onto tree trunks in your yard. After sundown, head out with a flashlight to see what flies in for a sip.



Regal Moth



HABITAT: Forests and wooded backyards



FLIGHT SEASON: May–September



ACTIVE TIME: 9 p.m.–midnight



CATERPILLAR FOODS: Hickories, pecan, and walnut

Like most giant silk moths, male regal moths are smaller than females but have larger, more feathery antennae.

Polypheumus Moth



HABITAT: Forests, backyards, and wetlands



FLIGHT SEASON: April–September



ACTIVE TIME: 11 p.m.–1 a.m. and 3 a.m.–sunrise



CATERPILLAR FOODS: Maples, birch, and oaks

Named after a giant from Greek mythology who had a huge eye in the center of his head, polyphemus moths use their large eyespots to startle would-be predators.

Cecropia Moth



WING SPAN: 4–6 inches



HABITAT: Where forests and open areas meet



FLIGHT SEASON: April–July



ACTIVE TIME: 3 a.m.–sunrise



CATERPILLAR FOODS: Maples, willows, and plums

The cecropia is Missouri's largest moth. Some can be as large as a tea saucer.

Imperial Moth



WING SPAN: 4–5½ inches



HABITAT: Forests



FLIGHT SEASON: May–September



ACTIVE TIME: 11 p.m.–1 a.m.



CATERPILLAR FOODS: Maples, sycamore, and sassafras

Imperial moths hide on the forest floor during the day. Their wing patterns blend in with yellowish-brown leaves.

Luna Moth



WING SPAN: 3–4 inches



HABITAT: Forests and wooded backyards



FLIGHT SEASON: April–September



ACTIVE TIME: 11 p.m.–1 a.m.



CATERPILLAR FOODS: Walnut, pecan, hickories, persimmon, and sweet gum

All four of a luna moth's pale green wings have eyespots. This might convince would-be predators that the luna is a group of animals instead of a single tasty insect.

Io Moth



WING SPAN: 2–3 inches



HABITAT: Forests and wooded backyards



FLIGHT SEASON: May–October



ACTIVE TIME: Sunset–midnight



CATERPILLAR FOODS: A variety of grasses, flowers, shrubs, and trees

Male and female io moths aren't the same color. Males are yellow, and females are reddish-brown.

Moth vs. Butterfly

Differences between moths and butterflies are only scale deep. In fact, they have a lot in common because they're both members of a large group of insects called Lepidoptera, which means scaled wing. To tell them apart, look for these clues.

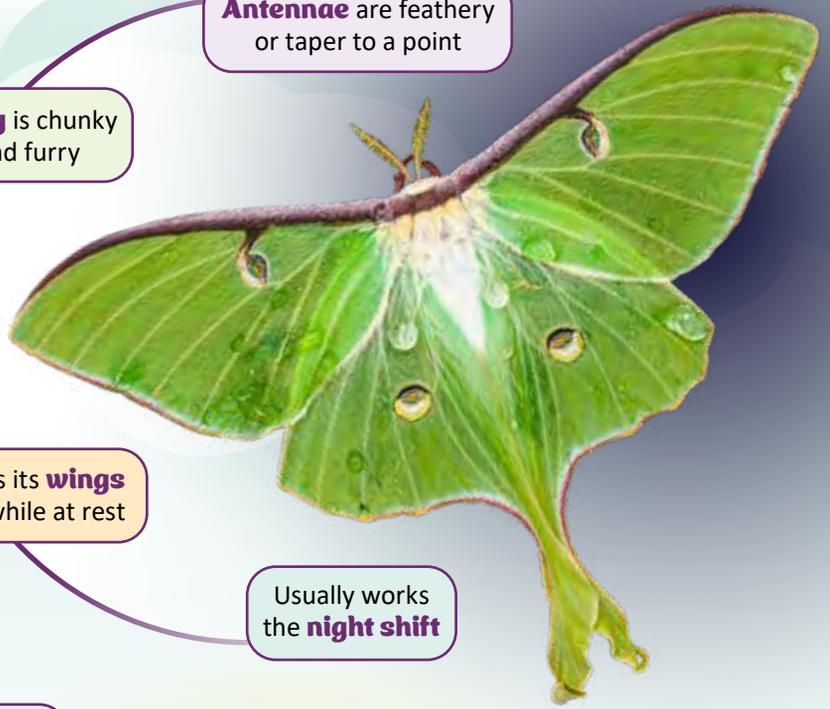
Luna Moth

Body is chunky and furry

Antennae are feathery or taper to a point

Holds its **wings** flat while at rest

Usually works the **night shift**



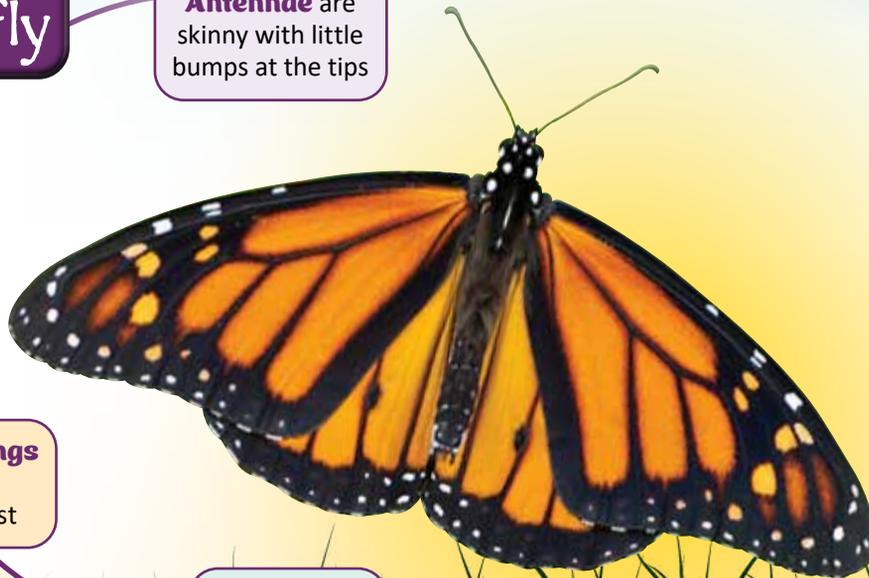
Monarch Butterfly

Antennae are skinny with little bumps at the tips

Body is slender and not as furry

Holds its **wings** vertically while at rest

Usually works the **day shift**



XPLOR MORE

Maze and illustration by Shannon Beaumont

Befuddled Bobwhites

Baby bobwhites are barely bigger than bumblebees, and predators rarely pass up a chance for quail kabobs.

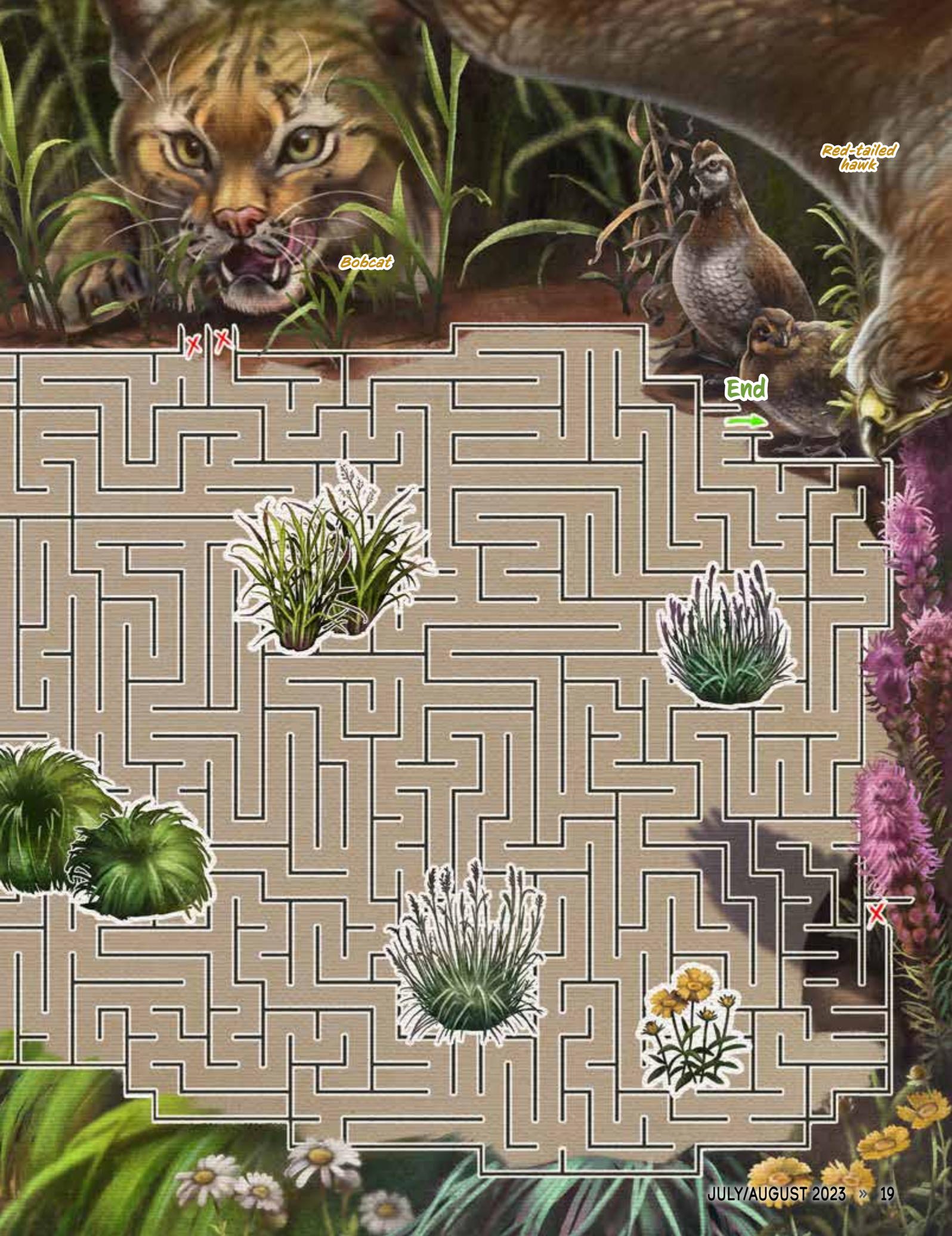
In fact, for every 10 bobwhites born in Missouri, only one will live long enough to see its first birthday. Good habitat, with bare ground that's easy for little chicks to run across and clumpy plants where they can hide, gives them a fighting chance.

Can you beat the odds and lead these little guys across the prairie to mom and pop?



Red fox

Bullsnake



Bobcat

Red-tailed hawk

End



GET OUT!

FUN THINGS TO DO
AND GREAT PLACES
TO DISCOVER NATURE



Slip an old pair of socks over your shoes and go for a stroll in the weediest place you can find. Soon, the socks will be covered with seeds. Stuff soil inside the socks, stick them in a baking pan, and soak them with water. Keep them damp, and in a week or so, **YOUR SOCKS WILL SPROUT!**

Beat the heat by splashing around in a creek to **CATCH CRAYFISH**. If you grab the little mudbugs by the backs of their shells, they can't pinch you. After you get a good look, put them back where you found them.



Widow skimmer

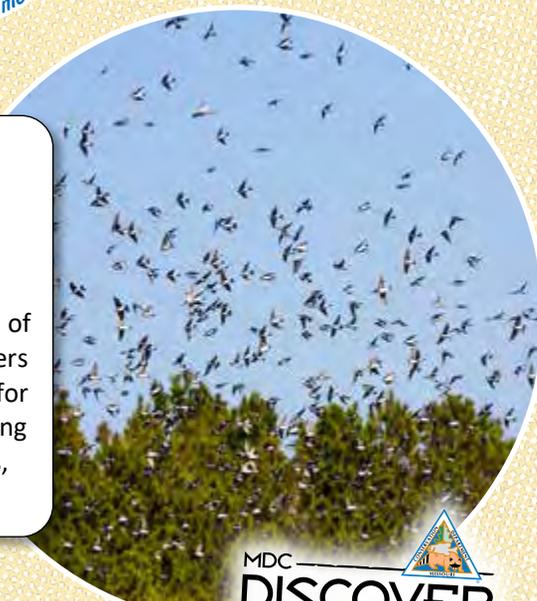
In July, **LOOK FOR DRAGONFLIES LAYING EGGS** in lakes, streams, and wetlands. Most dragon mamas deposit eggs by dipping their tails in water. Others make slits in aquatic plants like cattails and lay eggs inside.



American bullfrog

FROG SEASON OPENS at sunset on June 30. Wear clothes you don't mind getting filthy, grab a buddy, and head to a pond. Shine a flashlight in the face of the first frog you find. The frog will freeze, giving you time to sneak up and grab it.

In August, **SWALLOWS GATHER IN HUGE FLOCKS** before flying south. A whirlwind of thousands — sometimes hundreds of thousands — of these airborne insect-eaters is an amazing sight! Look for them swirling and swooping near wetlands, large lakes, and over crop fields.



SWALLOWS: © JEFFREY HOLCOMBE | DREAMSTIME.COM



Looking for more ways to have fun outside? Find out about Discover Nature programs in your area at mdc.mo.gov/events.

MDC
**DISCOVER
nature**

WHAT IS IT?

— FROM PAGE 3 —



BLUE DASHER

Dragonflies, like this female blue dasher, are some of the deadliest hunters on Earth. Biologists believe they catch nine out of 10 of the flying insects they chase. Their huge eyes are the secret to their success. Each eye contains up to 30,000 lenses that help the hunter spot prey in nearly all directions at once. Dragonflies can't sting, and they pose no danger to anything bigger than a bug. Look for them patrolling ponds, streams, and wetlands all summer long.

GO FIND IT!



Cut out this critter card and take it with you outside. How many of the things on the card can you find?

EASTERN CHIPMUNK



HOME SWEET HOLE

Chipmunks live in tunnels that they dig into wooded banks, under fallen trees, and inside stone walls and log piles.

A CHIP OFF THE OLD BLOCK

Mama chipmunks have babies in spring and summer. Litters contain up to eight but usually four or five blind, hairless newborns.

HARDCORE HOARDERS

In the fall, chipmunks pack their nests with thousands of nuts and seeds so they'll have plenty to eat during winter.

DIFFERENT NAPS FOR DIFFERENT CHAPS

Some chipmunks hibernate, some sleep only during cold snaps, and some stay active all winter long.

BUILT-IN GROCERY BAGS

Large pouches line a chipmunk's cheeks. A 'munk can cram four acorns into each cheek and carry one between its teeth.

To subscribe, cancel your subscription,
or update your address, visit
mdc.mo.gov/xplor.

FREE TO MISSOURI HOUSEHOLDS

GO FIND IT!

Chipmunks are found throughout Missouri but are most common in the Ozarks. They prefer wooded edges rather than deep forests. For more on 'munks, scurry over to mdc.mo.gov/field-guide.

EASTERN CHIPMUNK

